

## CLAIMS

1. A method of treating a transplant, comprising:  
administering to the transplant a vesicle, comprising:
  - (i) a T cell-apoptosis-inducing molecule, and
  - (ii) a phospholipid which is a stable vesicle former,  
wherein the vesicle has a fusion rate of at least 20 vesicle fusions/second.
2. The method of claim 1, wherein the T cell-apoptosis-inducing molecule comprises a lipid moiety.
3. The method of claim 2, wherein the T cell-apoptosis-inducing molecule further comprises a biotin moiety.
4. The method of claim 3, wherein N-biotinoyl-1,2-dihexadecanoyl-*sn*-glycero-3-phosphoethanolamine comprises the lipid moiety.
5. The method of claim 3, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of avidin or streptavidin.
6. The method of claim 5, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of FasL.
7. The method of claim 1, wherein the transplant is heart or skin.
8. The method of claim 1, wherein the vesicle has a fusion rate of at least  $10^3$  vesicle fusions/second.
9. The method of claim 1, wherein the vesicle further comprises ATP.
10. A method of treating a transplant, comprising:  
administering to the transplant a vesicle, comprising:

(i) a phospholipid which is stable vesicle former,  
(ii) at least one member selected from the group consisting of  
another polar lipid, PEG, a raft former and a fusion protein, and  
(iii) a lipid,  
5 wherein the vesicle has a fusion rate of at least 20 vesicle  
fusions/second.

11. The method of claim 10, wherein the T cell-apoptosis-inducing  
molecule comprises a lipid moiety.

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12. The method of claim 11, wherein the T cell-apoptosis-inducing  
molecule further comprises a biotin moiety.

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13. The method of claim 12, wherein N-biotinoyl-1,2-dihexadecanoyl-*sn*-  
glycero-3-phosphoethanolamine comprises the lipid moiety.

14. The method of claim 12, wherein the T cell-apoptosis-inducing  
molecule comprises a chimeric polypeptide of avidin or streptavidin.

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15. The method of claim 14, wherein the T cell-apoptosis-inducing  
molecule comprises a chimeric polypeptide of FasL.

16. The method of claim 10, wherein the transplant is heart or skin.

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17. The method of claim 10, wherein the vesicle has a fusion rate of at  
least  $10^3$  vesicle fusions/second.

18. The method of claim 10, wherein the vesicle further comprises ATP.

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19. A method treating a transplant, comprising administering to the  
transplant a T cell-apoptosis-inducing molecule.

20. A vesicle, comprising:  
a phospholipid which is a stable vesicle former; and  
a T cell-apoptosis-inducing molecule.

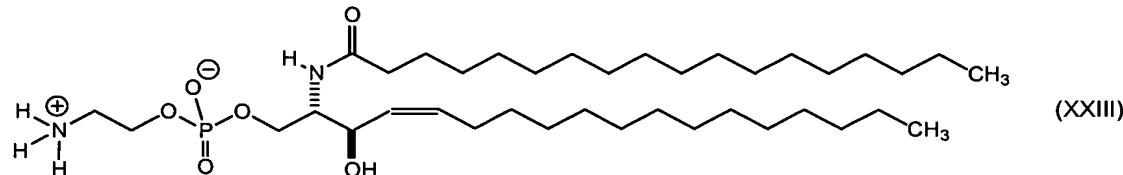
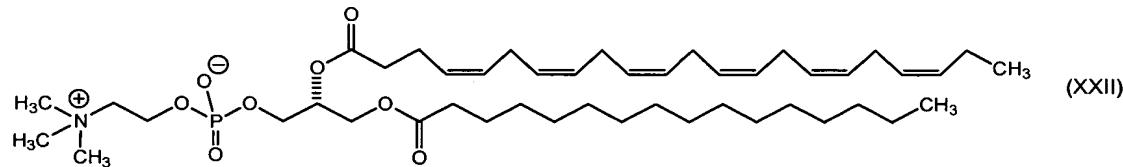
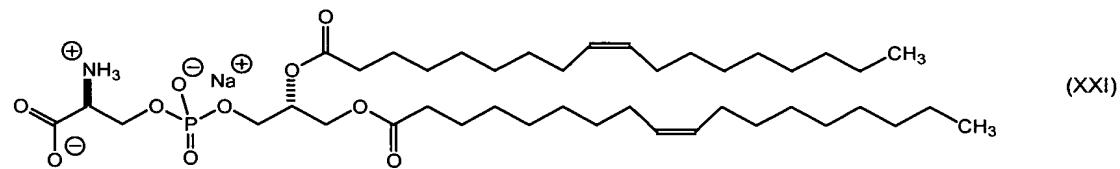
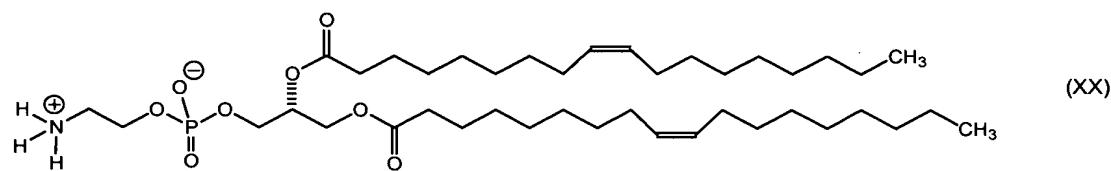
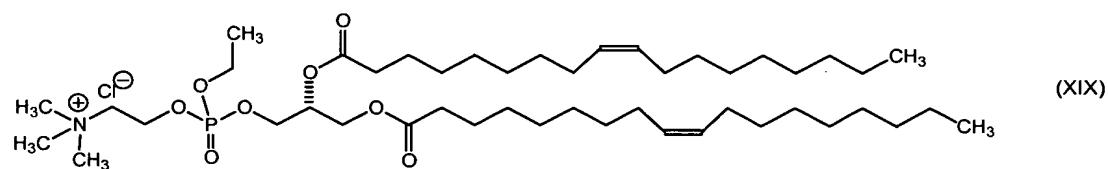
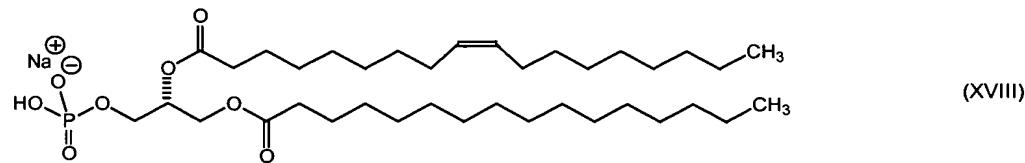
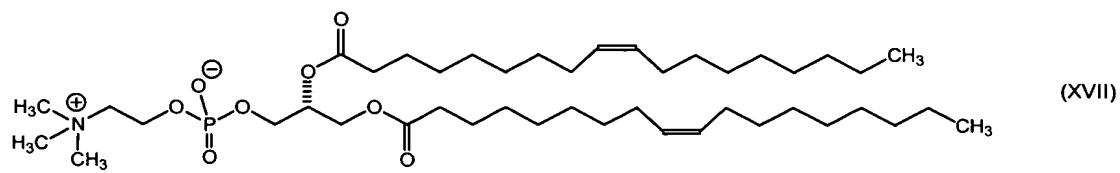
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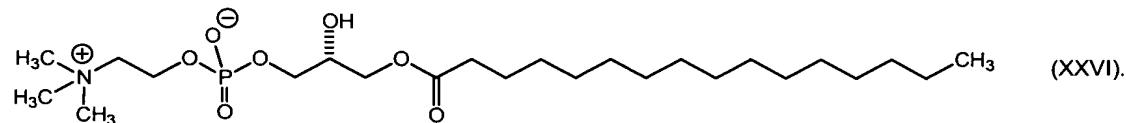
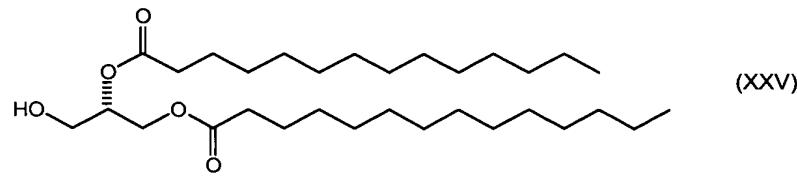
21. The vesicle of claim 20, wherein the T cell-apoptosis-inducing molecule comprises a lipid moiety.

22. The vesicle of claim 21, wherein the T cell-apoptosis-inducing  
10 molecule further comprises a biotin moiety.

23. The vesicle of claim 22, wherein N-biotinoyl-1,2-dihexadecanoyl-*sn*-glycero-3-phosphoethanolamine comprises the lipid moiety.

15 24. A vesicle, comprising:  
(i) a T cell-apoptosis-inducing molecule,  
(ii) a phospholipid which is stable vesicle former, selected from  
the group consisting of 1,2-dioleoyl-*sn*-glycero-3-phosphocholine, 1-palmitoyl-2-  
docosahexaenoyl-*sn*-glycero-3-phosphocholine and a mixture thereof, and  
20 (iii) at least one member selected from the group consisting of a  
polar lipid which is not a stable vesicle former and PEG,  
wherein the polar lipid which is not a stable vesicle former  
has a structure selected from the group consisting of formulas (XVII), (XVIII),  
(XIX), (XX), (XXI), (XXII), (XXIII), (XXV) and (XXVI)





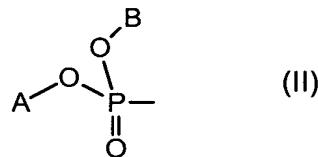
and

wherein the phospholipid which is stable vesicle former has a structure of

5 formula (I)



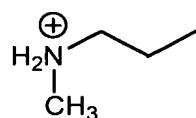
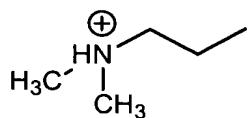
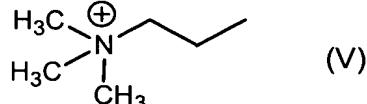
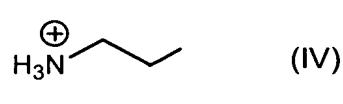
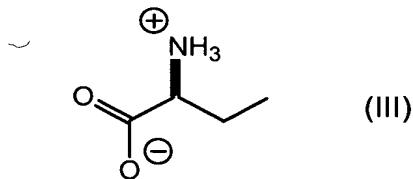
wherein X is H, or has a structure of formula (II)



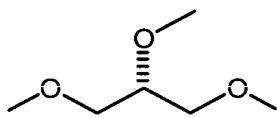
B is a cation or an alkyl group,

10 A is H, or has a structure selected from the group consisting of formulas

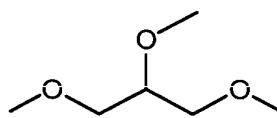
(III), (IV), (V), (VI) and (VII)



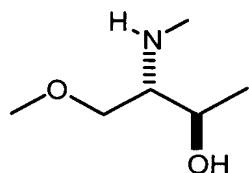
L has a structure selected from the group consisting of formulas (VIII), (IX) or (X)



(VIII)



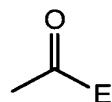
(IX)



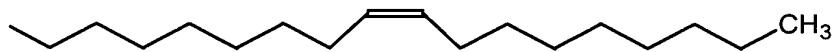
(X)

and E has a structure selected from the group consisting of (XII), (XIII), (XIV),

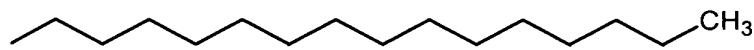
5 (XV) or (XVI)



(XI)



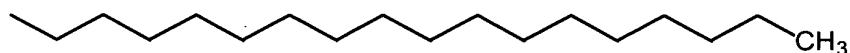
(XII)



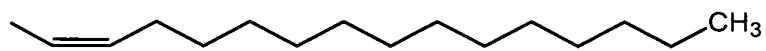
(XIII)



(XIV)



(XV)



(XVI)

25. The vesicle of claim 22, wherein the T cell-apoptosis-inducing molecule comprises a chimeric polypeptide of avidin or streptavidin.

26. The vesicle of claim 25, wherein the T cell-apoptosis-inducing  
5 molecule comprises a chimeric polypeptide of FasL.

27. The vesicle of claim 20, wherein the transplant is heart or skin.

28. The vesicle of claim 20, wherein the vesicle has a fusion rate of at  
10 least 20 vesicle fusions/second.

29. The vesicle of claim 20, wherein the vesicle has a fusion rate of at least  $10^3$  vesicle fusions/second.

15 30. The method of claim 20, wherein the vesicle further comprises ATP.

31. The vesicle of claim 20, wherein the lipid is N-biotinoyl-1,2-dihexadecanoyl-*sn*-glycero-3-phosphoethanolamine, and the T cell-apoptosis-inducing molecule is a chimeric polypeptide of a FasL polypeptide and at least one biotin-binding domain.  
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32. A transplant contacted with a vesicle of claim 20.

25 33. A method of transplanting a transplant, comprising:  
contacting the transplant with a vesicle of claim 20; and  
transplanting the transplant.

34. The method of claim 33, wherein the donor and recipient are immunohisto-incompatible.  
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35. A method of transplanting a transplant, comprising:

transplanting a transplant into a recipient without administering immunosuppressive therapy.

36. In a method of transplanting a transplant, including  
5 transplanting a transplant into a recipient,  
administering to the recipient immunosuppressive therapy, the  
improvement comprising:  
contacting the transplant with a vesicle of claim 20.

10 37. A method of treating a transplant, comprising:  
administering to the transplant:  
a T cell-apoptosis-inducing molecule, and  
a vesicle, comprising

15 (i) a means for binding the T cell-apoptosis-inducing  
molecule, and  
(ii) a phospholipid which is a stable vesicle former,  
wherein the vesicle has a fusion rate of at least 20 vesicle fusions/second.

38. The method of claim 37, comprising the sequential steps of:  
20 (i) administering the vesicles to the transplant; and  
(ii) administering the T cell-apoptosis-inducing molecule to the  
transplant.

39. A method of treating a transplant already transplanted according to  
25 the method of claim 37.